Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PHYSIOGRAPHIC NOTES.

BY

RALPH S. TARR.

GEOLOGICAL INFLUENCE ON PLANT DISTRIBUTION.—Much has been written about geographical distribution of plants in a large way, but very little has appeared upon small areas. An interesting paper in the latter connection has recently been prepared by Hollick (*American Naturalist, 1899, XXXIII, 1–14*), who considers the distribution of trees in New Jersey with reference to the geological structure. He finds that there are really three zones, (1) the zone of the deciduous trees in the northern part, (2) the coniferous zone near the sea coast, and (3) what he calls the tension zone between the two. The coincidence of these zones with belts of different geological formation is very striking, and suggests the relation of cause and effect. It would be exceedingly interesting if this study could be carried far enough to include other plants than the forest trees. This paper by Hollick suggests the possibility of important studies in geographic distribution made by those who are able to appreciate the geological and soil conditions, as well as the botanical names of the plants collected.

RECENT EARTH MOVEMENT IN THE GREAT LAKES REGION.—The evidence of past uplifts in the region of the Great Lakes and elsewhere has given some geologists reason for thinking that the land might still be in motion. In the September number of the *National Geographic Magazine, 1897*, Mr. G. K. Gilbert gave an abstract of certain studies which he had made upon evidence of recent earth movement. A more complete statement of his studies has now appeared (*18th Annual Report U. S. Geological Survey, pp. 595–647, 1898*), including a careful record of his data and an analysis of the apparent results to be deduced from them.

Gilbert had four pairs of stations, each pair being connected by a northeast and southwest line. From bench marks at these places observations upon the change in lake level have been carried on for from 20 to 37 years. A careful study of these shows that in each case the bench mark at the northeastern end appears to have risen, the amount varying in different cases, but the average giving the result of an increase of about forty-two hundredths of a foot per 100 miles, per century. While this result is small, and there are certain possibilities of error in excess of the result, the two facts (1) that such a change is to be expected in exactly this direction, and (2) that in all four cases the same general result has been obtained, are considered by Gilbert as practically proving the fact of tilting. He says, "It seems to me that the harmony of the measurements and their agreement with prediction from geologic data make so strong a case for the hypothesis of tilting that it should be accepted as a fact, despite the doubts concerning the stability of the gages." Nevertheless he proposes a plan for more precise future measurement which, if followed, will settle the question definitely, for it is certain that many will not consider that the fact of tilting is now proved.

Gilbert adds to his paper an abstract of the botanical studies made by Moseley, which seem to show that some of the islands on the south shore of Lake Erie have been formed by the partial drowning of the land through tilting, and he finds evidence that this drowning had recently been in progress.

If Gilbert's conclusions are correct, and if the tilting continues to proceed uninterruptedly at the rate calculated by him, very important changes will result in the course of time. In this connection Gilbert says that the water of the Great Lakes will eventually flow into the Illinois River past Chicago, as it once did. Upon this point he states, "Evidently the first water to overflow will be that of some high stage of the lake, and the discharge may at first be intermittent. Such high-water discharge will occur in 500 or 600 years. For the mean lake stage such discharge will begin in about 1,000 years, and after 1,500 years there will be no interruption. In about 2,000 years the Illinois River and the Niagara will carry equal portions of the surplus water of the Great Lakes. In 2,500 years the discharge of the Niagara will be intermittent, failing at low stages of the lake, and in 3,500 years there will be no Niagara. The basin of Lake Erie will then be tributary to Lake Huron, the current being reversed in the Detroit and St. Clair channels."

It is to be presumed that if nature is really engaged in this particular work of overturning, as we now know she has been in the past, man will prevent the success of the effort. It would be most disastrous to many cities already well established, particularly in the Canadian provinces, to have withdrawn from them the water supply which has been so important in determining their location.

A STUDY OF CHRISTMAS ISLAND.—In the Indian Ocean, south of Java, is a tiny island rarely visited by Europeans, and inhabited by but very few men. This island, known as Christmas Island, is interesting to the zoologist and botanist because it represents a mid-oceanic island upon which the flora and fauna have been very slightly modified by man; and a study recently made by Andrews (*The Geographical Journal, 1899, XIII, 17–35*) shows that it is of marked physiographic interest also.

The island consists of a rim of reef rock, reaching an elevation of 1,170 feet at the highest point, in the interior of which is a depression which closely simulates the form of a partially completed atoll. On the seaward side of the raised rim of this saucer-shaped upland are lofty cliffs, indicating former sea action with marked clearness; and still lower than this, at the present sea level, the waves are engaged in the formation of similar cliffs. Where breached by the waves, the island below the upper reef rock is shown to be composed of a platform of foraminiferal limestone, with layers of basaltic lava.

The interpretation that Andrews places upon the structure of the island on the basis of these facts is that upon a submarine volcanic platform, beds of foraminiferal limestone were accumulated at a time when the depth of the water was too great for coral growth, thus raising the elevation of the platform. This was assisted partly by uplifts of the platform and partly by flows of lava, the upper ones of which are now lifted above sea level. Finally the water shallowed sufficiently for corals to grow and these built an atoll, which, with the continued elevation, was lifted until it has become dry land, and denudation has revealed something of the internal structure. This history, which has been worked out by Andrews, lends support to the Murray hypothesis for the origin of atolls, and is in harmony with the results obtained by Agassiz in the Fiji Islands.

DESERTS AND GLACIERS OF CENTRAL ASIA.—Trained geographers are rare, and books of travel generally contain less matter that is important than unimportant, trivial details, often to be sure, woven into an entertaining narrative. Through most of these books the physiographer, for example, will search in vain for anything having a really important bearing upon his subject. It is, therefore, with a sense of relief and satisfaction that one seeking for new facts upon physical geography reads the pages of Dr. Sven Hedin's *Through Asia* (*Harper Bros., 1899*). In a few paragraphs it would be impossible to note all of his contributions to the Physical Geography of the Pamirs, the Desert of Gobi, and the mountains and plateaux of northern Tibet. Nearly every page of the two volumes would need to be abstracted in order to reach that end.

First in importance, however, is his discussion of the basins of interior drainage which he visited, notably the vast basin occupied by the great Desert of Gobi. As a mere description of a desert and desert conditions, his account of his struggle against death in the journey over a part of the eastern end of this great sand waste is probably unexcelled by anything ever written upon deserts. It will doubtless stand as a classic desert description. He tells how the sands have advanced so as to bury ancient cities, and to cause the abandonment of an important highway; and he relates many interesting things concerning the drainage of the great rivers that enter the desert, and their struggle against the ever encroaching sands.

Dr. Hedin's account of this region, important as it is, leaves the physiographer unsatisfied. Was this desert once the seat of large lakes, as our own Great Basin once was ? and has the climate changed since men lived there? He does not answer this question specifically, but his statements of fact, scattered here and there through the book, lead one to think that the answer to each question is *yes;* and, if so, there is here a physiographic problem of the utmost importance and well worthy of detailed investigation.

Dr. Hedin has made interesting studies also of some of the valley glaciers of the Pamirs, and has told us of the glaciers in other high mountains of that region. But, more important still, he has pointed out that these were once more extensive than now, thus proving this region to be in harmony with the glaciated mountainous regions of Europe and North America. But just how extensive were they? and what relation did their former extension have to the possible lakes? Here also are two unanswered questions. It is evidently a rich field for the physiographic geologist, and it is to be hoped that when Dr. Hedin returns to that region on his next journey he may make further investigations in this direction.

R. S. TARR.